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Experience 1: curvilinear alignment, varying vegetation setbacks, rounded slopes.

Experience 2: split median, split grade, median vegetation.

Experience 3: one way curvilinear alignment.

Experience 4: tangent, focus on landmark.

Experience 5: viewpoint/information area.

Experience 6: curvilinear alignment, more open countryside.

Align vertical and horizontal curves with co-incident midpoints.

Where vertical and horizontal curves do not coincide the vertical curves should lead.

Arc and spiral highway design.

Consider separate alignments for divided highways.

Align tangents with land use and vegetation grid.

Tangents should focus on natural or man-made landmarks.

Ideal angle and distance from landmark.

Skirt the edge of clearings and sensitive areas.

Align roadway at the margin between scree slopes and vertical rock face.

Terraced cut slopes allow for subsequent revegetation.

Respond to vegetation patterns while traversing hillsides.

Align road through natural gullies or created breaks to follow natural terracing or linear rock strata.

The view to adjacent water bodies can substantially enhance the driving experience.

Views from the roadway can be accommodated without impacting the shoreline.

Where roadway alignments do impact on waterbodies aesthetics, shoreline treatment should be given a high priority.

Do not encroach on water bodies closer than 7.5 metres. This roadway would be better with a vegetated buffer between it and the river.

In this example care has been taken to preserve the vegetated edge adjacent to the lake.

Roadway alignment should not require clearing which overwhelms the natural dimensions of waterbodies.

Bridges should become an extension of the curvilinear alignment of adjacent roadways.

Align road through natural gullies or created breaks.

Angle the vertical approach into the valley at a minimum of 3 degrees, to show a perceivable response to the valley.

Angle the horizontal approach into the valley at a minimum of 3 degrees, to expose views away from the road to the valley length and walls.

Bridges should be designed as part of the horizontal and vertical alignment of the adjacent road. This straight bridge interrupts an otherwise graceful curvilinear alignment.

Focus on landmarks such as mountains, predominant hills, landmark trees, forests, shelterbelts, and/or landmark buildings.

Cross the edges of landscape units as this highway does passing from a forested area in the foreground, to an open grassland, and back into the forest in the distance.

Alternate between a sense of enclosure and long distance views (eg. forest vs. agricultural clearings, or tree groupings within a predominantly open landscape.

A varied median width can be used to enhance the driver's interest and attentiveness.

Alignment should change in response to significant visual features.

Limit the view of the road ahead within the area of effective vision to no more than three changes in alignment.

Avoid short vertical curves which may obscure the view to oncoming traffic.

In this photograph signs have been erected to warn motorists of restricted visibility as a result of a short vertical curvature.
Avoid a sequence of grade changes which may appear as a roller coaster.

Vertical (sag) curve should approximate horizontal curve length.

Vertical curve length should approximate length of effective vision.

Provide a visual screen between frontage roads and highways.

Align roads to avoid clearings at the ends of tangents.

Indicates minimum stopping sight distances at various design speeds. (Taken from RTAC)

The grassed safety recovery area at the edge of this roadway is provided to allow vehicles to make emergency stops. Typically these areas will not have slopes exceeding 5:1.

Shrubs used for median planting can provide an additional measure of crash protection.

For divided highways avoid convergent alignments where headlights will shine into the path of oncoming traffic.

In this photograph, vegetation within the median minimizes the impact of headlights from oncoming traffic.

A raised berm between opposing directions of traffic will also limit the impact of headlight glare.

The 'Area of Effective Vision' is expressed diagrammatically indicating a diminishing visual impact with increasing distance and greater angles away from the direction of travel.

The area of effective vision will become longer and more directional with increased design speeds.

When viewed from distances up to 5 km., where utility corridors cut through forest, screen the groundplane of the cleared right of way with vegetation and earthworks.

Make revegetation of the utility corridor where it intersects the road a priority.

Viewed from a distance of up to 5 km., where corridors cut through forests, screen the groundplane of the cleared right of way.

In treed areas, viewed from distances up to 1.5 km., screen the powerline support structure.

Do not align the road to focus on a powerline corridor at the end of a tangent.

Intersect the powerline with the road at the perpendicular or at an angle no less than 30 degrees.

In hilly or mountainous terrain, route the highway so that, from a distance of 0-1.5 km., the powerline, where it intersects the road, will not appear above the horizon line (e.g., descending into a local low point with midground backdrop).

Where cut has occurred within 3 years and when viewed from a distance of 5-8 km., avoid alignments which focus the road on dominant lines of the cut.

When viewed from within 1.5 km., screen the area of the cut in its entirety.

Additional space is required to construct an adequate visual screen which could have concealed this timber cut.

Set aside a 20 m wide visual screen within the right of way, exclusive of future road widening and clearing requirements, OR require a 20 m wide perpetually forested screen within the adjacent allocated timber license area.

Align tangents away from those commercial uses which are unsightly. For business operations immediately adjacent to the road, provide room for a minimum 20 m wide vegetative buffer. Buffer may take the form of an earthwork berm if appropriate to local terrain.

Buffers of native vegetation should be minimum 20 m width in rural areas.

Alignment does not allow sufficient room to screen these commercial billboards on private property. More signs are being erected in cleared areas to the right of the photograph. There is not sufficient right-of-way to establish a buffer zone.

Some planting has been undertaken to screen this hydro installation. A more continuous planted buffer would have been more successful.

Where highways are aligned on upper slopes recognize the opportunity to create spectacular viewpoints.

Skirt open spaces which provide views (e.g., agricultural or forest clearings or open spaces associated with water such as rivers, streams, oceans, lakes, reservoirs, marshes, bogs).

Expose views for a minimum of 0.5 seconds for fleeting views, 5.0 seconds for panoramic views.
Retain natural elements which provide a break from the view for a minimum of 0.5 seconds, at irregular intervals (5 minutes apart). maximum.

Align road along forest edges. Forested conditions require alignment to respond to changes in vegetation type and density.

Align roads parallel to hedgerows and make tangents focus on significant landmark trees.

This maple retained within the median contributes to the overall quality of the highway and to the driver's experience.

Expose road surface to direct sunlight from east and south directions by alignments skirting clearings, providing for feathering of vegetation on south and east, and decreasing amount of cut zones.

Where aesthetics warrant vegetation close to the pavement, review early morning sun angles to minimize icing. Adjust alignment and/or vegetation to reduce problems as identified.

In this photograph an ecologically well resolved culvert outflow needs additional care to create an aesthetically satisfactory solution.

Roadway alignment should recognize and skirt sensitive habitat areas.

Alignment should follow property boundaries where possible. Small, isolated parcels should be purchased for right of way.

Borrow pits can be integrated into earthwork design within the right of way.

Where clearing access routes cannot be contained within the right of way, separate the route from the highway by a 20 m buffer.

During felling operations be careful not to disturb fragile areas.

Initially, clear only the lines required for control line and cross section survey.

Refine alignment to avoid special topography or features revealed during control line survey, prior to mass site clearing.

Inspect the outer 10% of the proposed clearing to find landscape features which might be saved by minor readjustment to proposed grading.

Prior to clearing the outer 10%, assess visual screen and noise abatement requirements.*

Assess dead, dying and wind susceptible plantings, removing only those which pose a threat to the area within paving edge, future above ground utility lines, sight lines and sight triangles.**

Finished clearing should respect objectives for visual, and environmental factors, in addition to engineering requirements.

Vegetation closer to the highway can help slow down traffic where the design speed is reduced.

Retain vegetation whose mature height will not exceed 600mm above the finished elevation of the highway.

Selective clearing should be guided by highway safety requirements and aesthetic considerations.

Clear lower limbs of overhanging trees to 5m clear height.

Native vegetation retained within the median can help reduce the impact on oncoming headlights.

Note how utility lines are concealed by Arbutus trees retained at the roadway edge.

Retain vegetation along the shores of waterbodies.

Vary the edge of the clearing line to create an undulating forest edge. Avoid a forest edge which has a regular undulating pattern. Keep undulations random, and similar to adjacent natural conditions.

Retain undisturbed root zone as required to protect trees to remain from potential wind throw hazard.

Tree clumps provide variety within forest clearings.

Clearing should emulate the natural forest edge transition from grasses to shrubs to pioneer trees to mature forest.

Clear sufficient length and at an angle to expose the view at the design speed.

Limbing trees can offer filtered views.

In long clearings, consider retaining specimens or clumps to break up the view.

Minimize views to timber cuts uphill from the road.

* Prior to clearing the outer 10%
** No additional care needed for aesthetic solutions.

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Ministry of Transportation & Highways
Techniques for screening downhill timber cuts can be quite different than for uphill cuts.

Careful selective clearing and leave areas can screen fill banks and retaining walls.

In most roadways within roadside facilities, native vegetation should be allowed to meet the pavement edge.

Native vegetation higher than 300 mm should be removed within a 5m radius of entrances to buildings or other structures.

Where picnic tables are located in the woods, allow a minimum of 1 m between table pads and trees. In this example one of these tables should have been located further away from the existing trees.

Remove laneforms as required for safe sight distance.

Borrow areas within the right of way can be shaped to resemble naturally occurring topography.

This substantial fill disposal site is largely concealed from the highway because of the vegetation left at the roadway edge.

Borrow pits and access routes to pits can be screened by vegetation. Locate borrow pit and access road to leave effective vegetation buffer.

This permanent quarry site would have been better located further from the roadway edge and concealed from view by a vegetated buffer.

This retention pond located within the right of way could have been designed to create a more naturalistic shape.

Stockpile topsoil within the limits of cleared areas in well drained areas.

Topsoil samples should be collected from the site and tested to determine nutrient content, texture, and structure.

Topsoil should be retained for areas of high visibility, which are most likely to be revegetated with trees or shrubs, such as interchanges.

At natural drainage channels, blend the slope to create 'lay-backs'.

Typical feathering of the ends of a slope.

Typical rounding at top and bottom of slope.

Avoid the appearance of unnatural steepness on short slope lengths.

These naturally occurring laybacks can be reproduced during earthworks design and construction.

Grade around rock or rock outcrops so as to maintain a natural appearance.

Typical 'bell-mouth' swale and related feathering.

Design earthworks to avoid damage to trees and vegetation to be retained.

Avoid fill over the roots of trees to be retained as has been done in this photo.

Example of blasted rock face which simulates a natural rock outcrop.

Example of a smooth wall blasted rock face incorporating benches for stability.

Avoid excessive depth of ditches.

Make ditch side slopes as flat as practical, and relate to adjacent terrain.

Ditch alignments need not be parallel with the edge of pavement. Ditches should respond to adjacent terrain.

Consider perforated drains rather than ditches to drain granular sub-base, where longitudinal slope is adequate.

Blend created ponds or created retention basins to simulate naturally occurring depressions.

Minimize the visual impact of ditches and steepness of slopes in medians.

Typical culvert end with concrete flare. See Figure A-4 for alternate example.

Construct berms with a varying height, length and alignment to avoid visual monotony.

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Decorative paving should be installed in traffic islands and medians where space is insufficient to allow planting.

Wood post and agricultural style woven wire are appropriate for wildlife fencing. Note that fencing is routed through the trees in some cases.

Consolidate several signs onto a single support structure. Signs and sign lighting enclosures should be of equal length to create a clean silhouette.

Avoid locating signs where they obstruct views.

Typical Class A Safety Rest Area Schematic Plan. Note: Each Rest Area plan must respond to the local site.

Typical Class B Safety Rest Area Schematic Plan. Note: Each Rest Area plan must respond to the local site.

Typical Class C Safety Rest Area

Typical Pullout Schematic Plan. Note: Each pullout plan must respond to the local site.

Typical Pullout.

Include provision for handicapped access and enjoyment in rest areas. Note the extended table top and slab at this table.

Good relationship between parking and picnic area - convenient, but with some separation.

A custom designed building for a rest area.

Create curbed islands and curvilinear entrance roads.

Avoid excessively large parking areas for car parking.

Provide interpretive display and photo opportunity.

Marsh outlook. Note deck to control access to marsh.

A scenic overlook without adequate protection for pedestrians.

A scenic overlook with reasonable pedestrian protection. Note Innovative combination of post barriers and signage

Interpretive signage grouped at the end of a short secondary path.

Primary path to building and site features.

Secondary path located away from major circulation area.

Tertiary path. Note closeness to nature in this path.

Tertiary path. Emphasis in tertiary path design should be on exposing the natural attributes of the site.

In this example utility poles have been located away from the highway to preserve a particularly important view adjacent to a tourist facility.

In this example utility poles have been located on the outside of a curve within the area of effective vision.

This situation is much better where utility poles are not within the area of effective vision.

Locate poles and standards on curve and/or tangent to side of road away from significant views.

Locate poles and standards to the inside curve, where views are equal.

When views along tangents are equal, locate standards and poles to the side opposite the approaching curve’s predominant view.

Consider attaching utility lines to cliff faces.

Locate lines behind a vegetative screen where lines must follow topography.

Lighting for signage should match the length, scale and colour of the sign.

Illuminating this water cascade and bridge structure will create an interesting night driving experience.